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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,317	06/28/2004	Shinichi Kawasaki	12088/019001	9863

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EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/500,317

Applicant(s)

KAWASAKI ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 60-69 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 60-69 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37.CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/14/2006</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “protrusive end part”, “integral case body”, “electrode body”, “internal space”, “second case body” must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

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pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 60-69 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Applicant's claimed "protrusive end part" is nowhere present in Applicant's specification with a reference number and Figure showing the structure in relationship to the remaining claimed structures such as unshown and unspecified parts discussed above.

5. Claims 60-69 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Because Applicant's claimed "protrusive end part" is nowhere present in Applicant's specification with a reference number and Figure showing the structure and function in relationship to the remaining claimed structures such as unshown and unspecified parts discussed above, the Examiner's determination of equivalence is strictly based on a broad interpretation of the below prior art.

6. Claim 62 recites the limitation "first integral case body" and "second integral case body". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

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8. Claims 60-62, 65, 66, and 69 are rejected under 35 U.S.C. 102(a,e) as being anticipated by Denes, Ferencz S. et al. (US 20030129107 A1). Denes teaches a plasma (100; Figure 1,2; [0025]-[0026]) surface processing apparatus (Figure 2; [0025]-[0026]) for processing a surface of a material to be processed (200; Figure 2; [0025]-[0026]) with a processing gas plasmatized (100; Figure 1,2; [0025]-[0026]) under an electric field, said apparatus (Figure 2; [0025]-[0026]) having an electrode structure (Figure 3; [0033]) for generating said electric field, said electrode structure (Figure 3; [0033]) comprising: a metallic electrode body (140; Figure 1,3; [0033]); and a dielectric case (148, 138, 122; Figure 3; [0033]) provided as a solid dielectric layer disposed on said electrode body (140; Figure 1,3; [0033]), said dielectric case (148, 138, 122; Figure 3; [0033]) including an integral¹ case body (114+148+138; Figure 3; [0033]) which has an opening (inner area of 114; Figure 1) and an internal space (volume occupied by 140; Figure 3) communicated to said opening, said electrode body (140; Figure 1,3; [0033]) being received in said internal space (volume occupied by 140; Figure 3) through said opening (inner area of 114; Figure 1), said integral case body (114+148+138; Figure 3; [0033]) being provided with a protrusive end part (114; Figure 3; [0033]) on a side of said opening (inner area of 114; Figure 1) thereof, said protrusive end part (114; Figure 3; [0033]) being protruded relative to said electrode body (140; Figure 1,3; [0033]), as claimed by claim 60

Denes further teaches:

- i. An electrode structure (Figure 3; [0033]) according to claim 60, wherein said dielectric case (148, 138, 122; Figure 3; [0033]) further includes: a lid (112; Figure 1,3; [0037]) made of a solid dielectric material for closing said opening, an end part of said lid (112;

¹ Integral – *adjective*. 2: composed of integral parts. <http://mw1.merriam-webster.com/dictionary/integral>.

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- Figure 1,3; [0037]) covering an end surface of said protrusive end part (114; Figure 3; [0033]) in a location more forward in a direction where said protrusive end part (114; Figure 3; [0033]) is protruded relative to said electrode body (140; Figure 1,3; [0033]), as claimed by claim 61
- ii. a plasma (100; Figure 1,2; [0025]-[0026]) surface processing apparatus (Figure 2; [0025]-[0026]) for processing a surface of a material to be processed (200; Figure 2; [0025]-[0026]) with a processing gas plasmatized (100; Figure 1,2; [0025]-[0026]) under an electric field, said apparatus (Figure 2; [0025]-[0026]) having an electrode structure (Figure 3; [0033]) for generating said electric field, said electrode structure (Figure 3; [0033]) comprising: an elongate metallic first electrode body (140; Figure 1,3; [0033]); a first dielectric case (148, 138, 122; Figure 3; [0033]) provided as a solid dielectric layer disposed on said first electrode body (140; Figure 1,3; [0033]), said first dielectric case (148, 138, 122; Figure 3; [0033]) including an integral first case body (114+148+138; Figure 3; [0033]) which has a first opening and a first internal space (volume occupied by 140; Figure 3) communicated to said first opening (inner area of 114; Figure 1), said first electrode body (140; Figure 1,3; [0033]) being received in said first internal space (volume occupied by 140; Figure 3) through said first opening (inner area of 114; Figure 1), said first integral case body (114+148+138; Figure 3; [0033]) being provided with a first protrusive end part (114; Figure 3; [0033]) on a side of said first opening (inner area of 114; Figure 1) thereof, said first protrusive end part (114; Figure 3; [0033]) being protruded relative to said first electrode body (140; Figure 1,3; [0033]) an elongate

metallic second² electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”) extending in a same direction as said first electrode body (140; Figure 1,3; [0033]); and a second dielectric case (any other 148, 138, 122; Figure 3; [0033]) provided as a solid dielectric layer disposed on said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”), said second dielectric case (any other 148, 138, 122; Figure 3; [0033]) including an integral second case body (any other 114+148+138; Figure 3; [0033] - claim 63 requires “separation” of “first” and “second” parts) which has a second opening (inner area of 114; Figure 1) and a second internal space (volume occupied by 140; Figure 3) communicated to said second opening (inner area of 114; Figure 1), said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”) being received in said second internal space (volume occupied by 140; Figure 3) through said second opening (inner area of 114; Figure 1), said second integral case body (any other 114+148+138; Figure 3; [0033] - claim 63 requires “separation” of “first” and “second” parts) being provided with a second protrusive end part (114; Figure 3; [0033]) on a side of said second opening (inner area of 114; Figure 1) thereof, said second protrusive end part (114; Figure 3; [0033]) being protruded relative to said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”), Dene’s first dielectric case (148, 138, 122; Figure 3; [0033]) and said second dielectric case (any other 148, 138, 122; Figure 3; [0033]) defining a gas passage in between, said gas passage allowing said processing gas to pass there through in a direction orthogonal to said direction in which said Dene’s first

² See Claim 63 – “separately formed”

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electrode body (140; Figure 1,3; [0033]) and said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires “separation”) extend, as claimed by claim 62

- iii. An electrode structure (Figure 3; [0033]) according to claim 62, wherein said first dielectric case (148, 138, 122; Figure 3; [0033]) and said second dielectric case (any other 148, 138, 122; Figure 3; [0033]) are integrally connected to one another, as claimed by claim 65
- iv. An electrode structure (Figure 3; [0033]) according to claim 62, wherein flow passage (142; Figure 3; [0033]) sectional area of said gas passage (142; Figure 3; [0033]) varies along a direction of gas flow, as claimed by claim 66 – horizontal 142 is shown as a smaller area than vertical 142.
- v. An electrode structure (Figure 3; [0033]) according to claim 62, wherein said first dielectric case (148, 138, 122; Figure 3; [0033]) is provided with a gas uniformizing passage (142; Figure 3; [0033]) for dispersing said processing gas uniformly in a direction in which said first electrode body (140; Figure 1,3; [0033]) extends and for introducing said processing gas into said flow passage (142; Figure 3; [0033]), as claimed by claim 69

Claim Rejections - 35 USC § 103

- 9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
- 10. Claims 63 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes, Ferencz S. et al. (US 20030129107 A1) in view of Watabe; Masahiro (US 5500256 A). Denes is discussed above.

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Denes does not teach:

- i. An electrode structure (Figure 3; [0033]) according to claim 62, wherein said first dielectric case (148, 138, 122; Figure 3; [0033]) and said second dielectric case (any other 148, 138, 122; Figure 3; [0033]) are separately formed, as claimed by claim 63
- ii. An electrode structure (Figure 3; [0033]) according to claim 63, wherein said first dielectric case (148, 138, 122; Figure 3; [0033]) has an opposing surface abutted with said second dielectric case (any other 148, 138, 122; Figure 3; [0033]), and said opposing surface is provided with a recess to serve as said gas passage (142; Figure 3; [0033]), as claimed by claim 64

Watabe teaches an electrode plasma apparatus (Figure 3) including unmixed gas injection plenums (1x-3x; Figure 4A,B; column 5; lines 18-44; column 1; lines 65-67).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to reproduce and/or make separable Denes's electrode structure (Figure 3; [0033]).

Motivation to reproduce and/or make separable Denes's electrode structure (Figure 3; [0033]) is for introducing unmixed and unreacted gases into processing as taught by Watabe (column 2; lines 61-67). It is well established that the duplication of parts is obvious (In re Harza, 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04). Further, it has been held that it is obvious to make whole elements separable (In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961) – MPEP 2144.04

11. Claims 67 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Denes, Ferencz S. et al. (US 20030129107 A1) in view of Anders; Andre et al. (US 6137231 A). Denes is discussed above. Denes does not teach:

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- i. An electrode structure (Figure 3; [0033]) according to claim 62, wherein Dene's first dielectric case (148, 138, 122; Figure 3; [0033]) has a plate (138; Figure 3; [0033]) dividing said gas passage (142; Figure 3; [0033]) and said first internal space (volume occupied by 140; Figure 3), and a thickness of said plate (138; Figure 3; [0033]) varies along a direction of gas flow in said gas passage (142; Figure 3; [0033]), as claimed by claim 67
- ii. An electrode structure (Figure 3; [0033]) according to claim 62, wherein a distance between said Dene's first electrode body (140; Figure 1,3; [0033]) and said second electrode body (any other 140; Figure 1,3; [0033] - claim 63 requires "separation") varies along a direction of gas flow in said gas passage (142; Figure 3; [0033]), as claimed by claim 68

Anders teaches a similar plasma source array (Figure 9). Specifically, Anders teaches a thickness of said plate/electrode (164/162; Figure 9) varies along a direction of gas flow in said gas passage (from 160 to outside of the structure; Figure 9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to dimension Denes's plate/electrode such that a thickness/distance varies along a direction of gas flow in said gas passage.

Motivation to dimension Denes's plate/electrode such that a thickness/distance varies along a direction of gas flow in said gas passage is for forming high quality films resulting from a "constriction" (column 4, lines 54-67; column 3, lines 1-13).

Response to Arguments

12. Applicant's arguments with respect to claims 60-69 have been considered but are moot in view of the new grounds of rejection.

13. Applicant's arguments are solely based on the claim amendments filed. Further, because of Applicant's lack of support for both amended claim elements and existing claim elements, the Examiner's 112-based rejections require clarification in both the specification and drawings by adding corresponding figure numbers and figures, where shown, for the claimed elements.

Conclusion

14. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-

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1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.



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